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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/620,137

07/14/2003

Seongsin Kim

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11/17/2004

AGILENT TECHNOLOGIES, INC.

Legal Department, DL429

Intellectual Property Administration

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EXAMINER

PERKINS, PAMELA E

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/620,137

Applicant(s)

KIM ET AL.

Examiner

Pamela E Perkins

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>11/12/03</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to the filing of the application papers 14 July 2003. Claims 12-20 are pending; claims 1-11 have been canceled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornton (6,208,681) in view of Jiang et al. (5,719,893).

Thornton discloses a method of manufacturing a vertical cavity surface emitting laser (VCSEL) where a vertical stack structure having a substantially planar top surface is formed including a top mirror (114) (col. 5, lines 55-67), a bottom mirror (104) (col. 4, lines 40-43), a cavity region (106/108/110) disposed between the top mirror (114) and the bottom mirror (104) and including an active light generation region (108) (Fig. 3; col. 5, lines 11-41), at least one of the top mirror (114) and the bottom mirror (104) having a layer (112) with a peripheral region (124) oxidized into an electrical insulator as a result of exposure to an oxidizing agent, wherein the vertical stack structure defines two or more etched holes (126) each extending from the substantially planar top surface to the oxidized peripheral region (124) (Fig. 8; col. 6, lines 12-35).

Referring to claims 18 and 19, Thornton discloses disposing a top electrode (130) over the substantially planar top surface of the vertical stack structure and circumscribing a light emission region substantially free of any overlying moisture penetration barrier material (col. 7, lines 21-49).

Thornton does not disclose passivating each of the etched holes by an overlying moisture penetration barrier

Jiang et al. disclose a method of manufacturing a vertical cavity surface emitting laser (VCSEL) where a vertical stack structure having a substantially planar top surface is formed including a top mirror (127), a bottom mirror (109), a cavity region (113/117/123) disposed between the top mirror (127) and the bottom mirror (109) and including an active light generation region (117); and passivating the substantially planar top surface by an overlying continuous moisture penetration barrier (140) (Fig. 2; col. 2, lines 1-27).

Referring to claims 13 and 16, Jiang et al. disclose the moisture penetration barrier (140) having a thickness selected or lateral surface area sufficient to prevent substantial vertical moisture intrusion (col. 5, lines 40-56).

Referring to claim 20, Jiang et al. disclose the moisture penetration barrier (140) includes a peripheral edge intersecting the top surface of the vertical stack structure at a moisture penetration interface; and the top surface of the vertical stack structure is circumscribed by a respective peripheral edge having a substantial portion separated from the moisture penetration interface by a distance sufficient to prevent substantial lateral moisture intrusion (Fig. 2, col. 5, lines 40-56).

Referring to claims 14 and 15, Jiang et al. disclose a moisture penetration barrier of claim 12 wherein the moisture penetration barrier comprises silicon nitride and may have thickness of 335 nm (col. 5, lines 40-53). It is noted that the specification contains no disclosure of either the critical nature of the claimed concentrations or any unexpected results arising there from. It would have been obvious to one of ordinary skill in the art to form the moisture penetration barrier with a thickness of 500 nm or greater since it has been held that "In such an situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) See MPEP § 2144.05.

Since Thornton and Jiang et al. are both from the same field of endeavor, a method of manufacturing a vertical cavity surface emitting laser (VCSEL), the purpose disclosed by Jiang et al. would have been recognized in the pertinent art of Thornton. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Thornton by forming an overlying moisture penetration barrier as taught by Jiang et al. to chemical protect and passivate while allowing light to be emitted (col. 5, lines 53-56).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hu et al. (6,658,040) disclose a method of manufacturing a vertical cavity surface emitting laser (VCSEL) where a vertical stack structure having a substantially planar top surface is formed including a top mirror, a bottom mirror, a cavity region disposed between the top mirror and the bottom mirror and including an active light generation region, wherein the vertical stack structure defines two or more etched holes each extending from the substantially planar top surface.

Thornton et al. (6,246,708) disclose a method of manufacturing a vertical cavity surface emitting laser (VCSEL) where a vertical stack structure having a substantially planar top surface is formed including a top mirror, a bottom mirror, a cavity region disposed between the top mirror and the bottom mirror and including an active light generation region; and an overlying moisture penetration barrier.

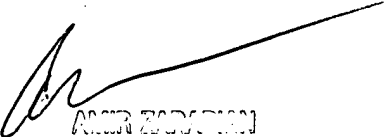
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pamela E Perkins whose telephone number is (571) 272-1840. The examiner can normally be reached on Monday thru Friday, 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2822

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PEP


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